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# A Prototype Model of a Trade-Finance Facility in Developing Countries: an Export-Import Bank

Technical material prepared by the UNCTAD secretariat*

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## INTRODUCTION

1. For many developing countries, increasing the export of non-traditional goods[1] is a major policy objective as a means of improving their industrial structure and balance of payments, especially their foreign-exchange receipts.

2. However, the expansion of non-traditional goods exports often faces difficulties in its financing. This is partly because the production process of non-traditional goods tends to be longer than that of traditional ones, and the collection of sales revenue may also take a longer period of time.

3. For developing country Governments, one of the policy tools to reduce exporters' financial burden in producing and exporting non-traditional goods is to facilitate the provision of preferential-term loans to the exporters of the targeted sector through a specialized agency.[2]

4. Official export support may take the form of a preferential loan given to the purchaser. All the major industrialized countries do this through export-credit agencies. It appears that low-interest credits have often been made available when exporters of a country are competing keenly for large orders with exporters from other countries. This helps industries such as aircraft and machinery more high-earning exports. Thus, the export credit agencies of industrialized countries have sometimes become involved in price wars with one another.

5. For today's developing and transition countries, on the other hand, Governments may be more motivated to provide export support because of their perception that the comparative-advantage differences in new industries are very small and, hence, preferential loans may propel infant exporting industries into a commanding first-mover position.

6. It should be noted that this type of support has two effects on resource allocation. First, it diverts financial resources towards export industries, to the possible detriment of other allocations of scarce resources. Second, it transfers revenue from the exporting to the importing country, except to the extent that the exporter can raise the price and recapture the transferred revenue from the importing countries.

7. This paper provides a model of a Government-supported export credit agency, mainly as a policy instrument to promote exports, particularly of non-traditional goods. It is assumed to be an independent agency, whose main function is the provision of direct credit to exporters. The choice of the modalities of export promotion obviously depends on various factors, including

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[1] Non-traditional exports are usually thought of as being manufactured goods. This may be too restrictive, however, since primary goods may often be non-traditional for some countries, even though they are traditional for others. The meaning of non-traditional should also be broadened to refer to non-traditional markets as well. Existing sources of trade finance for traditional products into traditional markets are not as readily available for non-traditional markets. This is particularly significant when considering the potential of South-South trade, for which there is little financing capability in place at either the importing or the exporting end.

[2] For the discussion on the role of government in support of export finance in particular, see for example, Angus Dunn and Martin Knight, *Export Finance*, Euromoney Publications, London, 1982 (pp. 13-14).

economic conditions and the capacity of the country in question. Hence, this model should be considered as one of the possible alternative measures of export promotion.

8. The model should be considered in the light of the Uruguay Round Agreement on Subsidies and Countervailing Measures, in which the signatory countries have agreed to abolish or reduce subsidies on exports. Official export credit, however, may not always imply a subsidy under the terms of the Agreement. Further, there are certain circumstances for which exemptions are provided, in particular for low-income countries, to which this model may be most useful.

9. The model draws heavily on the experience of the Korean Export-Import Bank.[3] It is also based on the survey of 140 developing-country trade-financing institutions conducted by the UNCTAD secretariat in 1995-1996.[4]

10. The basic character of the institution is described in chapter I. Chapter II explains in detail the main activities of the institution, i.e. financing and funding. Chapter III describes the financial management aspect of the institution. In chapter IV, a financial feasibility analysis is presented which attempts to provide a measure of the range of alternatives for the operation of the institution. The full results of the feasibility study are presented in a supplement to this paper (UNCTAD/ECDC/256/Supp.1).

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[3] Some examples in this model are expressed in Korean won. The period average market exchange rates are provided below for the convenience of the readers:

| year | US$/won | year | US$/won | year | US$/won | year | US$/won |
|---|---|---|---|---|---|---|---|
| 1976 | 484 | 1981 | 681.03 | 1986 | 881.45 | 1991 | 733.35 |
| 1977 | 484 | 1982 | 731.08 | 1987 | 822.57 | 1992 | 780.65 |
| 1978 | 484 | 1983 | 775.75 | 1988 | 731.47 | 1993 | 802.67 |
| 1979 | 484 | 1984 | 805.98 | 1989 | 671.46 | 1994 | 803.45 |
| 1980 | 607.43 | 1985 | 881.45 | 1990 | 707.76 | 1995[p] | 772.32 |

[p] preliminary

*Source*: IMF International Financial Statistics.

[4] "Review of progress in trade-finance facilities of developing countries at the interregional, regional and subregional levels," UNCTAD/ECDC/254, 22 March 1996.

# I. BASIC CHARACTER OF THE FACILITY

## A. Modalities for export support

11. There are three ways of supporting exports: direct credit, guarantees, and insurance. While these three services are complementary, a developing country may need to prioritize them, taking into account financial resources, the effect on export promotion, the degree of development of their banking and insurance system, etc. In the early stage of export financing, it is probably reasonable to give priority to the provision of export credit, and then consider enhancing insurance and guarantee services at a later stage.

12. In many developed and some advanced developing countries, export credit, particularly short-term credit, is available from commercial banks at competitive rates. Thus, policy in these countries focuses on enhancing insurance and guarantee facilities rather than providing direct credit.

13. However, the situation of most developing countries is different. Their commercial financing institutions are often not as well organized as those in developed countries. Many do not have the banking network necessary to make the provision of insurance and guarantees practical. In addition, developing countries may need to encourage their exporters to increase their foreign-exchange resources. Thus, developing countries may need to improve the financial terms of their direct export credits through, for example, lower interest rates and longer maturity periods.

14. Moreover, from the viewpoint of export promotion, direct export credit is more effective than insurance and guarantees, in that it has a larger autonomous financial base as compared to insurance and guarantees, whose autonomous source for funding is limited to small insurance premiums and guarantee fees.

## B. Options for organizing export financing

15. The two options for Governments to organize export financing on preferential terms are:

(a) Having an independent export credit institution and an independent insurance/guarantee institution, or an institution combining the two functions;

(b) Having the Central Bank and/or commercial banks perform some trade-financing functions.

16. The merits and demerits of an independent export-financing institution *versus* the Central Bank's or commercial banks' involvement in trade financing are as follows:

(a) An independent export-financing institution is more efficient, since it can concentrate solely on the export-financing business, including both financing and funding aspects, and it can also develop techniques and know-how for export financing. In addition, an independent institution can

avoid risks associated with other banking business. Further, its lending policy could reflect priorities set in a long-term strategic development plan. However, when a country establishes an export-financing institution, it has to pay additional costs related to managing the newly established institution;

(b) The major merit of having a Central Bank or commercial banks manage export financing concerns the utilization of their staff and facilities. However, export financing is not the main task of a Central Bank or commercial banks. For the Central Bank, the main task is to ensure monetary stability, and for the commercial banks to conduct ordinary commercial lending. Hence, their policies may not always reflect the priorities and needs of export promotion. Also, they may not provide sufficient resources for export financing, or they may lack an appropriate infrastructure to handle export financing.

17. In sum, if the Government wishes to promote exports through the provision of preferential loans, the most efficient way is to establish an independent agency, whenever feasible in resource terms. This agency may also deal with the other two types of services, i.e. insurance and guarantees. In the early stage of export financing, however, it is desirable for the agency to devote a large portion of its resources to direct credit.

**An argument for the export bank**

"In many ways, the export bank route is the more efficient. An export bank, wholly owned by the government, will have a credit rating almost indistinguishable from that of its government. It will be able to fund the consolidated balance of its lending by borrowing in the capital markets in an aggressive and professional manner and obtaining the finest terms on offer. It will not be constrained to match amounts, maturities or drawing schedules to those of particular export transactions. It will be borrowing in its own name, negotiating the terms and conditions of each operation directly with its lenders."

Angus Dunn and Martin Knight
*Export Finance*, Euromoney Publications, London, 1982 (p.11)

**Example: Organization of export financing in the Republic of Korea**

- Short-term export credit is being dealt with by commercial banks and the Central Bank on commercial terms.

- Medium- and long-term export credit is being operated by a single institution, The Export-Import Bank of Korea (Korea Exim Bank), on preferential terms.

## C. The characteristics of the institution

18. It is therefore assumed in this paper that an independent agency specializing in trade-financing services, henceforth termed the Bank, has been established in a given developing country.

19. It is further assumed that the mandate of the Bank is to support government policy of export promotion by providing preferential financing and thereby increasing the export industries' competitiveness. The profitability of the Bank is hence a secondary consideration in comparison with similar commercial establishments.

20. In order for the Bank to discharge the above mandate, it is suggested that the Government have the majority stake in the Bank, that the Bank's lending policy reflect government policies, and that the Government provide low-cost financing to the Bank through the direct transfer of resources, government credits, bond issues, etc.

21. The Bank provides export financing on the assumption that the credit risk of the buyer is underwritten or guaranteed implicitly by the supplier's Government or an entity of equivalent standing. The credit risk is, therefore, effectively that of the supplier's Government and roughly equivalent to that on its other obligations. In this sense, the provision of export credits represents an alternative to the financing of other government activities.

22. Some countries allow the banking system to make larger loans available for exports than the authorities would normally accept on the basis of national practices or internationally accepted standards. In some systems, direct refinancing facilities for the banking sector are available; the Government is thus not only supporting the provision of export credits but, in refinancing, is acting in its own right as the eventual lender.

## D. The organization of the institution

23. The Bank should be organized on the basis of efficiency in terms of its size and the qualifications of its staff.

24. The Bank should have two decision-making bodies: a Board of Directors and a Managing/Executive Board.

### *1. Board of Directors*

25. The Board of Directors establishes the basic policy guidelines pertaining to the business operations and management of the Bank. The Board of Directors consists of representatives of Government, the Central Bank, trade associations, the Bank, etc.. The Government can reflect its export policy through this Board. For this purpose, the Government may wish to have the majority of seats in the Board of Directors.

### *2. Managing/Executive Board*

26. The Managing/Executive Board is a decision-making body within the Bank. It is

composed of the Bank's President, Deputy President, and Executive Directors. It decides and resolves important matters pertaining to the business of the Bank. The Board of Directors deals with matters that should be considered for the purpose of the national economy, while the Managing/Executive Board deals with issues for the purpose of the Bank's management.

*3. Officers*

27. The Bank has the following officers: one President, one Deputy President, not more than five Executive Directors, and one Auditor. If the Government is a majority shareholder, the above-mentioned officers are appointed or dismissed by the Board of Directors, upon recommendation of the Government.

28. The President represents the Bank, administers and directs the operations of the Bank, and appoints and dismisses the employees.

29. The President, the Deputy President, Executive Directors and Auditor are appointed or dismissed by the Government.

*4. Auditing*

30. The Bank has one Auditor, who inspects and examines the operations and accounting of the Bank. The Government regularly audits the Bank through an independent inspection body.

## II. FINANCING AND FUNDING

### A. Eligibility of beneficiaries

31. For the purpose of diversifying the export structure, export credit will be extended for non-traditional goods. Also, for the purpose of improving foreign-exchange earnings, other commodities may be supported if they are considered markedly conducive to the maintenance and development of export and import markets.

32. Credit can also be extended to importers who require advance payment necessary to facilitate the import of essential materials and major resources.

33. The Bank may establish eligible items for export credit to maximize the effect of export promotion with limited financial resources:

(a) In selecting the proper items, the Bank should consider two factors: first, export products should have great external effects on the national economy and, second, the products should have comparative advantages in the international market. The external effect of a product can be calculated by combining the effects on production, income, balance of payments, etc., through input-output tables;

(b) To determine the extent of products' dynamic comparative advantages, an analysis of the revealed comparative advantage (RCA) index, introduced by Bela Balassa, may serve as a basis. The method should be modified in order to leave enough room for dynamic structural changes in new industries. (The method used to forecast change in dynamic comparative advantages and the Republic of Korea's case are referred to in annex I.)

34. In those countries where short-term export credit is provided by commercial banks, the Bank should stipulate eligibility criteria in respect of maturity, export items, etc., in order to avoid competition with commercial banks.

### B. Annual export credit support

35. How much export credit the Bank should support annually depends on the Bank's funding ability. Though export promotion is achieved insofar as financial support for exports is provided, developing countries should consider financial implications in other economic sectors. On the one hand, export credit has a positive effect on the gross national product (GNP) and the balance of payments[5]. On the other hand, export credit may generate a cost that the national economy has to pay, since there are differentials between market interest rates and preferential export credit rates. Even though the interest rate gap may be small, the allocation of resources to

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[5] Export promotion due to the provision of export credit will improve the balance of payments. However, if the credit is medium- or long-term, the balance of payments can worsen in the short term, since collection of loans is made in the long term while payments for the import of raw materials is made immediately.

**Example: Eligibility of beneficiaries in the Republic of Korea**

The Korea Exim Bank makes capital goods eligible for credits only for the items for which commercial banks are unwilling to provide loans because of the high risk, the large loan amount, the long period of loan collection, etc.

Most of the export credit of the Korea Exim Bank, from its establishment in 1976 until the end of the 1980s, was concentrated on shipbuilding. Even though such a concentration of loans caused some problems such as unbalanced distribution of financial resources, it contributed to the enhancement of competitiveness in the shipbuilding industry.

Eligibility requirements are established as follows:

1. Supplier credit

Eligible borrower: Exporter from the Republic of Korea

Eligible items:

(a) Industrial plants, ships, rolling stock, and their accessories, raw materials, spare parts and components;
(b) Iron and steel products and non-ferrous metal products;
(c) Industrial machinery, electrical equipment, and their components;
(d) Transportation vehicles, aircraft, and their components;
(e) Railway rails and their components;
(f) Optical, precision and medical instruments, and their components;
(g) Containers.

Cash Payment:

- A cash payment of not less than 20 per cent of the export contract value is required for ships, and not less than 15 per cent of the export contract value for other items.

Maximum repayment term:

- The repayment term varies, up to a maximum of 10 years, with due consideration given to such factors as generally accepted international agreements such as the Arrangement on Guidelines for Officially Supported Export Credits of the Organisation for Economic Co-operation and Development (OECD), the Berne Union Agreements, etc., the size of the contract value and the life of the capital goods.

(continued)

enhancing export credit may reduce the funds available for the development of other industries, and lead to high interest rates. In addition, credits in foreign exchange currency may increase foreign borrowings if there is a balance-of-payments problem, and can worsen the foreign debt problem.

**Example: Eligibility of beneficiaries in the Republic of Korea (continued)**

Repayment of principal and payment of interest:

- The principal is repaid equally on a semi-annual basis commencing six months from the date of delivery and thereafter every six months.
- The interest is paid on a semi-annual basis commencing six months from the date of delivery and thereafter every six months.

Repayment guarantees:

1. Letter of guarantee (L/G) or letter of credit (L/C) issued or confirmed by a credit-worthy international banking institution acceptable to the Bank.
2. L/G or L/C issued or confirmed by the Government or the Central Bank of the country.

2. Buyers' credit

Eligible borrower: Foreign buyers

Export contract value:

- The export contract value must be the equivalent of one million US dollars or more.

The other terms (eligible items, cash payment, maximum repayment term, repayment of principal and payment of interest, repayment guarantees) are the same as those for supplier credit

36. Thus, the Bank should consider the economic internal rate of return (EIRR) for export credit. The supply of export credit should be determined on the basis of its EIRR, which should be at least at the average level for the country. (Details on the calculation of EIRR are presented in annex II.)

37. However, since it is difficult to calculate a level of export financing exactly by means of EIRR, two methods are suggested for determining a proper level of export credit: first, the export credit can cover a certain portion of non-traditional exports; second, the level of export credit can be decided by a leverage of the Bank's total capital. For example, the Bank can provide export credit worth up to 10 times its total capital. (For a detailed description, please refer to chapter V on the financial feasibility analysis.)

## C. Fund-raising

38. There are several sources for the Bank's funding: capital, direct borrowings in domestic and foreign financial markets, issuance of bonds, net collection of loans, and discounted sales of promissory notes.

39. In addition, the Bank can look for a co-financing system with other domestic, foreign and regional development banks, and obtain relending facilities from foreign financial institutions.

*1. Capital*

40. Capital is contributed by the Government (the majority shareholder), the Central Bank, domestic financial institutions, exporters' associations and international financial organizations.

41. For the purpose of maximizing retained earnings, dividends to the Government and Central Bank should not be paid during the first stage, and those to other shareholders should be kept to a minimum.

42. The higher the share of capital in total financial resources, the smaller the borrowing costs and the easier the Bank's cash flow. However, it is generally difficult for developing countries to provide sufficient funds for the Bank due to their scarce budgetary income. In addition, as the viability of the Bank will be guaranteed by the Government, the capitalization standard may be lower than that for commercial facilities. In this model, capitalization is chosen as the leverage for the Bank to decide its export credit size. For example, if the Bank considers the leverage as five, it will keep its capital at a level equivalent to one fifth of the demand for its export credit. The capitalization decision is referred to in detail in the sensitivity analysis.

**Example: The capital ratio in the Korea Exim Bank**

(million Korean won, per cent)

| | 1976 | 1980 | 1985 | 1990 | 1994 |
|---|---|---|---|---|---|
| Total Assets (a) | 80,745 | 556,696 | 4,551,934 | 2,684,007 | 4,918,308 |
| Equity Capital* (b) | 65,456 | 195,660 | 467,635 | 658,345 | 957,643 |
| Capital Ratio (b/a) | 81.1 | 35.1 | 10.3 | 24.5 | 19.5 |

* Equity capital contains paid-in capital and reserves

· In the first year (1976) that the Korea Exim Bank was established, most of the total assets consisted of equity capital. During the following decade, the capital ratio declined sharply, from 81.1 per cent in 1976 to 10.3 per cent in 1985. Then, until 1990, the ratio increased moderately due to the decrease of total assets as a result of the increase in pre-repayment by borrowers. Since then, the ratio has slightly declined, though remaining at around 20 per cent.

*2. Borrowings*

43. Since capitalization will be low, borrowings may become an important means of raising the necessary funds. The more the Bank increases its borrowing, the more export credit demand it can meet. However, the borrowing cost will weaken the Bank's viability. Thus, the Bank should borrow up to an amount that provides maximized export credit at a point where the

marginal cost equals the marginal revenue.

**Example: The borrowing limits in the Korea Exim Bank**

The Korea Exim Bank stipulates that borrowing should not exceed 10 times the capital, although there is no specific economic rationale behind this limit. This debt ratio of 10 is a recommended level for Banks' viability in the Republic of Korea.

44. The sources of borrowing are the domestic and foreign financial markets. When the Bank looks for lenders, it should evaluate the availability of funds and the borrowing conditions, for example, interest rates and maturity. For the Bank, access to foreign markets will be much more difficult, since the Bank's creditworthiness may not be generally acknowledged in international financial markets. However, the Bank may need foreign currencies more than the domestic currency, especially when it provides medium-term loans, or when domestic interest rates are higher than international rates.

45. Borrowing in the domestic market:

(a) There are three types of domestic borrowing: borrowing from the Government or the Central Bank, borrowing from commercial banks, and issuing bonds.

(b) Of these, borrowing from commercial banks may need to be limited, because it could carry a negative interest margin. Hence, it should be used mostly in an emergency as a bridge-type loan.

(c) Borrowing by issuing bonds may be difficult, considering the undeveloped capital market in many developing countries. It can be used more as the capital market develops.

(d) Thus, domestic borrowing is usually dependent on the Government budget or a special fund in the Central Bank. In such cases, the interest rates may need to be lower than the market rates in order to limit the costs on the Bank's loans.

**Example: The domestic borrowing in the Korea Exim Bank**

In the Korea Exim Bank, a large portion of domestic borrowing was derived from a special fund, the National Investment Fund, which the Government established in the Bank of Korea for the purpose of allocating larger investments to heavy industry.

46. Borrowing from the foreign market:

(a) There are two sources of foreign currency: international commercial banks and traditional export credit agencies.

(b) The Bank can raise foreign currency on a large scale from syndicated loans or bonds supported by international commercial banks. However, without good creditworthiness, it would be difficult for the Bank to tap the market. Also, loans are generally offered to developing countries with a high spread. Moreover, foreign loans increase the foreign debt, which can be a serious problem in many developing countries.

(c) The Bank can use the multilateral financial institutions such as the World Bank, regional agencies (Asian Development Bank, Inter-American Development Bank, African Development Bank, etc.) or bilateral economic cooperation agencies. One of the merits of this is the concessional conditions of their funds. However, funds are generally offered in relation to specific projects, and obtaining them generally requires a long and complicated process.

(d) Thus, to secure funding, the Bank can contact foreign commercial banks and use relending facilities provided by export credit agencies and regional trade-financing institutions such as the Latin American Export Bank (BLADEX), the Arab Trade Financing Programme (ATFP), and the African Export-Import Bank (AfreximBank). At the same time, the Bank should try to enhance its creditworthiness in the international financial market so as to lower the spread.

(e) If the Bank, because of its low creditworthiness, cannot borrow foreign currency or has to accept a very high spread, it may be allowed to borrow foreign exchange from the Central Bank, thus avoiding an increase in the foreign debt of the country.

47. In conclusion, the Bank should reduce the portion of foreign borrowing as much as possible. Foreign borrowing usually involves variable interest rates, which may cause an unexpected interest burden if the London Interbank Offered Rate (LIBOR) rises sharply. To this end, there will have to be a cap on the ratio of foreign borrowing.

*3. Forfaiting*

48. In the early period of the Bank's establishment, forfaiting will be an important and useful means of obtaining foreign currency.

49. Using forfaiting:

When the Bank provides a medium-term loan, it receives the promissory notes that the importers issued as collateral. It can sell the notes within the maturity on the international market at discounted prices, which are determined according to the creditworthiness of the notes. If the notes are guaranteed by major international banks, for example, they can be sold at a very favourable price. Thus, the Bank can raise foreign currency regardless of its creditworthiness.

50. The problem is how many qualified notes the Bank can obtain, since the main customers

of the Bank will be developing country importers, who usually have low creditworthiness and whose promissory notes may not be sold on the international markets. Hence, the Bank should require that promissory notes issued by developing country importers be guaranteed by their Governments or major international banks. Meanwhile, if the Bank can enhance its own creditworthiness, the cost for the Bank of borrowing directly from the market could be more favourable than selling the notes.

*4. Collecting the loan amount*

51. The collectable loan amount is the most secure funding resource. Since it is a function of the disbursed loan amount and the financing conditions, the Bank can predict the receivable amount and period.

52. If all export credit the Bank deals with consists of short-term loans, the disbursed loans would become the new funding resource in 180 days.

53. Hence, the Bank should minimize loan loss through a thorough credit risk analysis.

*5. Looking for co-financing*

54. The co-financing system is very useful in supporting a large number of export projects with limited funds, and it is also helpful in distributing risk. The partners of co-financing can be domestic or foreign financial institutions. Co-financing with foreign banks is more desirable, because the Bank can support the local currency portion while the foreign partners extend the foreign currency portion of the export credit.

55. The problem with co-financing is that export creditors sometimes have to pay higher interest, since most partners are commercial institutions and they charge commercial interest rates.

*6. Introduction of a relending facility*

56. A relending facility entails the Bank establishing credit lines with export credit agencies, borrowing funds from them, and relending the funds to export credit receivers who want to import raw materials or capital goods required for exports. This facility provides several advantages to export credit receivers. First, their funding costs will be lowered, since the borrower becomes the Bank and, hence, they need not pay a banking guarantee fee. Secondly, they can use a foreign currency loan even if they do not have the ability to access the international financial market directly. This facility is a useful means for the Bank to provide export credit receivers with foreign currencies needed to produce export commodities.

## D. Lending policy

57. Each country can establish, in the light of its economic situation, certain guidelines for the selection of sectors and enterprises to be financed.

**Example: The funding sources in the Korea Exim Bank**

(Millions Korean won)

| | 1976 -1979 | 1980 -1984 | 1985 -1989 | 1990 -1994 |
|---|---|---|---|---|
| Capital | 142,855 | 223,000 | 170,000 | 148,000 |
| Borrowings from Government | 99,684 | 480,000 | 381,315 | 313,728 |
| Borrowings from domestic banks | 20,000 | 0 | 0 | 0 |
| Borrowings from foreign markets | 66,181 | 662,541 | 1,248,407 | 5,451,032 |
| Forfaiting | 72,062 | 1,272,923 | 965,814 | 107,844 |
| Relending facility | 0 | 69,622 | 0 | 0 |
| Collecting of loan amount | 172,260 | 282,258 | 91,455 | 2,653,630 |
| Others | 149,487 | 207,232 | 1,053,176 | 1,102,676 |
| Total | 722,529 | 3,197,576 | 3,910,167 | 9,776,910 |

(a) Those countries whose exports are mainly primary goods should encourage the Bank to handle only short-term export credit to promote the export of light manufactured goods.

(b) Those countries which already export some light manufactured goods should encourage the Bank to deal also with medium-term export credit to promote the export of higher-value-added products, in addition to the short-term credit.

(c) Those countries which aim to increase the export of capital goods should encourage the Bank to handle only medium- and long-term export credit and the commercial banks to cover short-term export credit, since these countries are likely to have a relatively developed commercial banking system.

58. The Bank can extend loans for both suppliers' and buyers' credit. In reality, however, almost all loans are likely to be suppliers' credits, which require a relatively simple procedure.

59. In order to maximize net foreign-exchange earnings, the Bank can stipulate a minimum local content for export products to be eligible for financing. The rate of required local content could vary depending on the type of products: for example, the more sophisticated the industry is, the lower the local contact requirement would be.

60. The Bank deals with diverse businesses related to export credit, including the following:

(a) It issues local letters of credit to local suppliers who supply the raw materials to export creditors;

**Example: The local content requirements in the Korea Exim Bank**

| Product | | Local content ratio (per cent) |
|---|---|---|
| Ships | General service ships | 75 |
| | Special service ships | 65 |
| Trains | Passenger trains and freight trains | 60 |
| | Electric trains and diesel locomotives | 50 |
| Containers | Steel containers | 75 |
| | Aluminium containers | 50 |
| Cars, excluding railway | | 60 |
| Railway rails | | 100 |
| Steel structures | | 65 |
| Parts | | 75 |
| Industrial plants | Cement | 40 |
| | Fertilizer | 20 |
| | Ethanol | 29 |
| | Thermal power plant | 25 |
| | Oil refining | 20 |
| | Formation | 47 |
| | Polyethylene | 37 |
| | Ethylene | 27 |
| | Nuclear power plant | 10 |
| | Caprolactam | 16 |
| | Wood-free printing paper | 24 |
| | Paper board | 25 |
| | Synthetic rubber | 23 |
| | Polyester | 27 |
| | Iron manufacture | 23 |
| | Polyvinylchloride | 34 |
| | Polypropylene | 19 |
| | Caustic soda | 23 |
| | Hydroelectric power plant | 57 |
| | Tyres | 29 |
| | Industrial liquefied gas | 18 |
| | Naphtha cracking | 12 |
| | Vinylchloride monomer, ethylene dichloride | 19 |
| | Soda ash (or sodium carbonate) | 43 |

(b) It provides a foreign importer with a guarantee to refund the cash payment for medium- and long-term transactions when it becomes impossible for the domestic exporter to perform as contracted;

(c) It provides a guarantee of principal and interest to co-financing banks. It deals with foreign exchange transaction business, including pre-shipment loans in foreign currency, foreign exchange dealings, etc.

## E. Financing conditions

### *1. Credit coverage*

61. The loan that the Bank extends to an exporter can vary in amount according to the exporter and the item. The higher the credit coverage ratio is, the greater the exporter's competitiveness becomes. Meanwhile, with a lower coverage ratio, the Bank can distribute its limited resources for export credit to more beneficiaries.

62. It is suggested that the Bank extend pre-shipment credit of up to 90 per cent of the contract value, and post-shipment credit of up to 80 per cent of the balance of the contract value, less the advance cash payment. In addition, a higher ratio should be provided to small and medium-size exporters which have weaker funding ability than big companies.

**Example: The credit coverage in the Korea Exim Bank**

- Trend of credit coverage ratio:

  - The Korea Exim Bank has often varied its credit coverage ratio from 70 to 100 per cent, according to the demand of exporters or the availability of co-financing. For example, when co-financing was encouraged, the credit coverage ratio was lower. It sometimes used to vary the ratio in the light of exporters' size or products. For example, for small and medium-size exporters, it offered a ratio of up to 100 per cent; high ratios were also offered to products whose international competitiveness was weak.

  - As of 1995, it provides a uniform credit coverage ratio regardless of export size and products, i.e. 90 per cent for pre-shipment loans and 100 per cent for post-shipment loans.

### *2. Loan interest rates*

63. Loan interest rates should be decided in the light of the competitiveness of exports, domestic market interest rates, and Uruguay Round stipulations regarding interest rates.

*Cases where the Uruguay Round rules on subsidies apply*

64. Under the Uruguay Round Agreement on Subsidies and Countervailing Measures (Annex I (k)), signatory countries have agreed to abolish or reduce subsidies on exports. This appears to imply that countries are in principle committed not to grant export credits at rates below those they actually pay for the funds. For example, if the Bank borrowed money at 5 per cent, it could not lend it at a rate lower than 5 per cent.

65. The Bank nevertheless has room for some support for exporters, for example by absorbing the additional costs of borrowing. The central monetary authority may also indirectly help the export sector enhance its competitiveness by keeping domestic interest rates low, since this allows the Bank to borrow at the low domestic rate and relend it at the low rate to the export

sector.

66. If the Bank follows the WTO stipulations, it can set interest rates for pre-shipment export credit at the prime rate plus spread. Here, the prime rates are the average of the prime rates of major domestic commercial banks. The spread will be fixed according to the borrower's creditworthiness and the loan period.

67. To determine the spread, the following method is suggested:

(a) *Spread on creditworthiness*: If borrowers provide a guarantee from domestic financial institutions or a physical collateral, the spread is zero. Without any guarantee, the spread increases up to a predetermined percentage (e.g. 2.5 per cent), according to the borrowers' creditworthiness. If borrowers provide a guarantee for a certain portion of the loan, the spread is calculated as the weighted average on the basis of the ratio of collateral.

(b) *Spread on the loan period*: The spread increases by a predetermined percentage (e.g. 0.5 per cent) for each additional year of the average loan period exceeding 1 year. Here, the average loan period is calculated on the basis of the following formula: (disbursement period/2) + the period from the end of the disbursement of the loan to the beginning of its repayment.

68. Creditworthiness encompasses the importer's country risk. The Bank can itself evaluate the country risk of the countries in question. It can alternatively use the reports of institutions specialized in international credit ratings, such as Euromoney (London), Institutional Investor (New York), International Country Risk Guide (New York), Business Environment Risk Information (Long Beach, California), etc.

69. In the case of post-shipment export credit, the Bank may follow the OECD guidelines, which stipulate the Commercial Interest Reference Rates (CIRR) to be used for loans.

Each OECD member country announces its CIRR every month. The CIRR is set at a level similar to that of the commercial rates applied to the country's leading borrowers. Most OECD member countries set their CIRR at the yields of five-year government bonds plus 1 per cent.

*Exemption and transitory measures*

70. There are clauses providing exemptions from the WTO rules on subsidies in certain circumstances. It appears that least developed countries and other developing countries with less than US$ 1,000 of gross domestic product (GDP) per capita are eligible for special and differential treatment. Other developing countries with a per capita GDP of more than US$ 1,000 are generally granted an eight-year transition period to phase out the prohibited subsidies, though the period is reduced if the export becomes "competitive" under the definitions provided in the Agreement.

71. Special and differential treatment may imply that the Bank can provide all types of export support, including lower interest rates. There are three options in deciding interest rates:

(a) The interest rates for both pre- and post-shipment loans are fixed at the same level;

(b) The pre-shipment credit has rates one per cent lower than post-shipment credit;

(c) Pre-shipment interest rates are fixed and post-shipment ones are variable.

72. In order to encourage exports, interest rates should be determined in such a way that the internal rate of return (IRR) of export industries exceeds the IRR of other sectors and their IRR is internationally competitive. In other words, in order to invite more investment in export industries, financial expenses in the export sector can be reduced so that the net profits after the deduction of financial expenses are larger.

73. While lower interest rates and longer loan maturity periods enhance the exporters' price competitiveness, they may weaken the Bank's profitability. Hence, these preferential financial conditions should be applied prudently so as not to damage the Bank's financial standing.

*3. Loan maturity*

74. The Bank should decide the loan period according to the loan amount, the customer's creditworthiness, the type of product, etc.

(a) As an example, if the loan amount is under US$ 10,000, the loan period may be up to 6 months; under US$ 25,000, up to 3 years; under US$ 150,000, up to 4 years; and over US$ 150,000, up to 5 years.

(b) If the loan is guaranteed by the Government or major commercial banks, the loan maturity can be longer.

(c) Medium- and heavy-industry goods will require a longer loan maturity.

## III. FINANCIAL MANAGEMENT

### A. Risk management

75. For the management of credit risks, the Bank should establish guidelines for country exposure, which is defined as loans outstanding to each country.

76. It is suggested that the Bank manage credit risks as indicated below:

*1. Estimating credit risk assets*

77. Credit risk assets should be estimated using the following equation:

Loan amount × (weight of country risk + weight of credit risk).

(a) The weight of country risk is determined according to the importing country's creditworthiness. The Bank can evaluate the country risk itself or use a specialized institution's evaluation results. The lower the creditworthiness of the importing country, the higher the weight of country risk becomes.

(b) The weight of credit risk is determined according to the importer's creditworthiness. If the importer's risk is guaranteed by a guarantor with better creditworthiness, the creditworthiness of the guarantor and its country is applied to the estimation of credit risk assets.

**Sample calculation of credit risk assets**

Assumptions

- Loan amount: US$ 1,000 million.
- Country risk rating: B class (weight: 20 per cent).
- Credit risk rating of foreign buyer: Second class (weight: 20 per cent).
- Guarantor's credit risk rating: First class (weight: 10 per cent).
- Domestic borrower's credit risk ratings: "BBB" in Standard and Poor's (weight: 40 per cent).

Calculation of credit risk asset in case of buyer's credit without guarantee

US$ 1,000 million × (0.2 + 0.2) = US$ 400 million.

Calculation of credit risk asset in case of buyer's credit with guarantee

US$ 1,000 million × (0.2 + 0.1) = US$ 300 million.

**Example: The estimation of credit risk assets in the Korea Exim Bank**

1. Weight of country risk:

| Country risk rating* | | Weight (per cent) |
|---|---|---|
| A | | 0 |
| B | | 20 |
| C | | 40 |
| D | D+ | 60 |
| | D | 70 |
| | D- | 80 |

* Country risk ratings, which are provided by the Overseas Investment Research Institute of the Korea Exim Bank, are categorized into A, B, C, D, and E. Those countries which are rated as E are not eligible for export credit.

2. Weight of credit risk of the foreign importer/buyer:

| Importer/borrower | | | Weight (per cent) |
|---|---|---|---|
| Government or central bank | | | 0 |
| State-run banks or public institutions | | | 10 |
| Private institutions | | | |
| | First class | Over A class in the rating of Standard and Poor's, Moody's; or within the top 300 ranking in The Banker's report | 10 |
| | Second class | BBB to BB class in the rating of Standard and Poor's, Moody's; or between 301st and 600th ranking in The Banker's report | 20 |
| | Third class | B to CC class in the rating of Standard and Poor's, Moody's; or between 601st and 1000th ranking in The Banker's report | 30 |

3. If the borrower is a domestic firm, i.e. if it is supplier's credit, the credit risk assets are further weighted according to the creditworthiness of the domestic borrower:

- 30 per cent for firms with "A" or better than "A" in the rating of Standard and Poor's, Moody's.
- 40 per cent for firms with "BBB" in the rating of Standard and Poor's, Moody's.
- 40 per cent for firms with "A" or better than "A" in the rating of domestic credit evaluation institutions.
- 100 per cent for firms without any rating.

*2. Management of country exposure*

78. The Bank should manage the country exposure so that the total credit risk assets of the importing country are kept within a reasonable limit (e.g. less than 25 per cent of the Bank's net assets, or less than 1 per cent of the importing country's GDP). Here, net asset is defined as paid-in capital, plus reserves and retained earnings.

## B. Management of operational profits/losses

79. Even though the Bank is not a profit-seeking institution, it should consider profitability for its sustainability, since it can support export credit only as long as it maintains its own viability.

80. Hence, the Bank, while seeking to increase the effectiveness of export promotion, should avoid a net operational loss. Ideally, the Bank should keep its net income at zero every year to maximize its export credit. However, in reality, the Bank should prepare for an unexpected loan loss. If the Bank actually recorded a net loss, it would see a decline in its creditworthiness and, hence, experience some difficulties in funding through markets. The Bank should therefore build up some level of loan-specific reserves on the basis of net income.

81. Thus, the Bank should decide the appropriate level of net income to be kept, as follows:

(a) In measuring the profitability of companies or banks, two indices -- return on assets (ROA) and return on equity (ROE) -- are used. Most supervisory offices for financial institutions in developed countries recommend that banks use ROA as their profitability index, since the net income is dependent on the operation of loan assets and the management of credit risk. The Bank will have to accept this recommendation. On the other hand, use of ROE is not appropriate for the Bank due to the specificity of its funding capital;

(b) In estimating an appropriate ROA level, the probability of loan loss has to be considered on the one hand and a competitive lending rate on the other. If the loan loss is expected to be high, the ROA level should be high. However, this requires high lending interest rates, which in turn reduces the competitiveness of exporters. Economic theory cannot provide practical guidelines in determining the equilibrium between the two factors. In the experience of established export credit agencies, ROA has mostly ranged between 0.1 and 0.5 per cent. Since developing countries' export credit agencies will generally have higher loan-loss rates, it is suggested that the ROA level be higher (e.g. 1 per cent).

82. As for the disposal of profits, the Bank should build up a loan-specific reserve with a certain portion of net income against unexpected loan losses. To this end, it should dispose of its net profits earned during each fiscal year, after providing for the depreciation of assets, by leaving a reasonable portion (e.g. 50 per cent) of the profits for the loan-specific reserve and retaining the rest of the earnings.

**Return on assets (ROA) of selected export credit agencies**

(US dollar millions)

| | Nigeria Exim (1993) | BLADEX* (January-June 1995) | Korea Exim (1994) | Japan Exim (1994) | India Exim (1994) | China Exim (1995) | KfW** Germany (1993) | BFCE*** France (1993) |
|---|---|---|---|---|---|---|---|---|
| Total assets | 366 | 3,976 | 6,121 | 86,588 | 972 | 1,227 | 115,112 | 34,394 |
| Equity | 39.5 | 397.5 | 1,358 | 12,665 | 187 | 165 | 3,135 | 670 |
| Net income | 3.7 | 32 | 35 | 414 | 4.4 | 5.2 | 198 | 36 |
| ROA | 1.01% | 0.80% | 0.57% | 0.48% | 0.45% | 0.42% | 0.17% | 0.10% |

* Banco Latinoamericano de Exportaciones
** Kreditanstalt für Wiederaufbau
*** Banque Française du Commerce Extérieur

*Source:* Reports by Export-Import Bank of Korea, BLADEX, Export-Import Bank of China and the Nigerian Export-Import Bank.

83. In order to build up an adequate loan-loss reserve and to maximize the effect on export promotion to the extent possible, dividends to capital contributors other than the Government and the Central Bank should be limited to a reasonable level (e.g. at a rate of no more than 10 per cent).

84. Profitability depends on the gap between earnings from lending and borrowing costs. Since the earnings from lending cannot be increased without negatively affecting the exporters' competitiveness, the Bank should attempt instead to reduce the cost of borrowing as much as possible to maintain profitability.

85. The Bank may incur a net loss due to risks related to the fluctuation of foreign exchange.

(a) Many export credits are extended in foreign currencies, while the borrowings are made in both local and foreign currencies. Hence, there will be a gap between foreign assets and foreign liabilities, which causes a foreign exchange risk. For example, the Bank suffers a loss when it has an oversold position (more foreign assets than liabilities) and if the domestic currency depreciates. This situation seems to be rather typical for developing countries.

(b) To avoid the foreign exchange risk, the Bank should hedge the difference of the position through a financial intermediary such as a currency swap, futures, forward contracts, etc.

86. In addition, the Bank may face an interest-rate fluctuation risk.

(a) Most export credits are based on fixed interest rates, while the funding rates from foreign markets are mainly variable. Accordingly, if international interest rates rise, when the variable-rate liabilities exceed the fixed-rate assets, the Bank suffers interest losses.

(b) The Bank should try to prevent interest losses by matching fixed-rate assets and variable-rate liabilities, or using interest-rate swaps.

87. When unforeseen losses occur, the Bank covers any net loss incurred during a particular fiscal year with its reserves. If reserves are insufficient, the Government could cover the loss under an established provision.

## IV. FINANCIAL FEASIBILITY ANALYSIS

88. By way of an illustration of how the Bank might work, a financial feasibility analysis was carried out. A summary of the analysis is presented in annex III, and its full results are reported in the supplement (UNCTAD/ECDC/256/Supp.1). It includes the analysis of a base case, as well as a sensitivity analysis measuring the impact of changes in different parameters.

89. The purpose of constructing this model is to provide a measure for the range of possible results in the operation of the Bank and to determine appropriate levels of capitalization, a lending portfolio, financial conditions, leverage, and liquidity. Obviously, these scenarios do not exhaust all the possibilities. They do, however, provide a range of alternatives that, taken together, give a sense of the real possibilities available to the Bank.

### A. Basic assumptions and alternative scenarios

90. For the base case, the values of the parameters are assumed as explained below. An attempt was made to make these assumptions represent, as much as possible, the general economic features of developing countries. At the same time, a sensitivity analysis was performed for changes in each of the nine parameters defined below. For each case, an alternative assumption was made within the range of acceptable practices. The assumptions for the base case and for the alternative scenario, representing a change in a parameter, were contrasted in part A of annex III.

#### *1. Capitalization*

91. The first determinant of the Bank's performance is its capital base. In reality, the size of the capital depends on each country's economic size. The base case assumes total paid-in capital of US$ 30 million for the first five years. This would be paid in three instalments of US$ 10 million each at the beginning of the first, third and fifth years of operation.

92. The net income generated each year is divided into loss-specific reserves and retained earnings, and will be added to capital. Thus, total capital includes the cumulative net income.

93. In an alternative scenario, the capital base is doubled in the first year -- i.e. the first-year, paid-in capital is increased by US$ 10 million.

#### *2. Liquidity*

94. Liquidity is necessary to provide an adequate cushion against adverse market developments that could affect either the Bank's ability to maintain its sources of financing or servicing of the Bank's borrowings. Liquid assets are deposited in domestic and foreign commercial banks or in the form of convertible securities. In principle, liquid assets would earn less than loans. Hence, greater liquidity could lower the profitability of the Bank. However, since the liquid assets have no credit risk, increasing them could increase profitability and compensate for higher loan-loss rates.

95. In the base case, the Bank is assumed to retain 10 per cent of annual export financing

needs for liquidity. Thus, actually disbursed export credit is 90 per cent of export financing needs. For the sensitivity test, the proportion of liquidity has been increased to 20 per cent.

*3. Lending policy*

96. The Bank provides short- and medium-term loans. The maturity of a short-term loan is less than 180 days, and the average maturity of a medium-term loan is five years. Thus, the repayment of a short-term loan the previous year can be a source of financing the next year, and in the case of a medium-term loan, the 20 per cent per year can be a source of financing the next year.

97. In developing countries, most export credit demand will be short-term, since, at the outset, the proportion of capital goods exports is small. In the base scenario, the ratio of short- and medium-term loans is assumed to be 90:10.

98. In the sensitivity analysis, this lending portfolio has been changed, so that the ratio of medium-term loans is gradually getting higher, i.e. under the alternative scenarios, the ratios of short- and medium-term loans would be 85:15, 80:20, 75:25, and 70:30.

*4. Lending rates*

99. When the Bank decides the interest rates for loans, it should take account of WTO rules. It should also consider the competitiveness of its financing conditions compared with those of other countries. In the case of least developed countries and developing countries with a GDP per capita of less than US$ 1,000, the Bank can be flexible in determining the lending rate. The interest rates for export credits should also depend on domestic market rates, which differ among countries. Hence, it is difficult to set standardized financing conditions that can be adapted in all developing countries.

100. For the base case, the interest rates on a short-term loan are assumed to be 9 per cent and on a medium-term loan 10 per cent. These rates may be lower than developing countries' market rates; however, the competitiveness of the Bank may require interest rates of less than 10 per cent.

101. For an alternative scenario, the rates have been increased by 1 per cent, i.e. to 10 per cent on short-term loans and 11 per cent on medium-term loans.

*5. Borrowing costs*

102. In some countries, lending rates could be quite low. In order to avoid a negative interest margin, however, the borrowing cost must also be kept low. In the base assumption, the interest rates for domestic-currency borrowings is 10 per cent. On foreign-currency borrowings, it is variable, with a LIBOR of 8 per cent plus a spread of 2 per cent.

103. The sensitivity analysis tested cases where the borrowing cost would rise by 1 per cent, 1.5 per cent, and 2 per cent, and where the LIBOR would increase to 10 per cent.

104. The maturity period of borrowings is assumed to be two years on domestic-currency

borrowings and five years on foreign-currency borrowing.

*6. Loan loss*

105. It is likely that the Bank would eventually undergo some loan losses. It is assumed that there would be no loan loss in the first year of operation, basically because it would take some time for loan performance to become clear. After the first year, however, loan-loss rates are assumed to be 1 per cent.

106. Under the alternative scenarios, the loan-loss rates have been increased to 2 and 3 per cent, respectively.

107. It should be emphasized that these are loan losses actually recognized. It is also foreseen that loan-loss reserves are built up by dedicating half of net income each year to these reserves. This would provide a cushion in case actual loan losses exceed what has been projected.

*7. Forfaiting market*

108. The sale of promissory notes in the international financial market could be a good source of foreign exchange. In this model, forfaiting is limited to medium-term loans, since short-term loans will be repaid within six months. Not all promissory notes can be sold because the investors require major banks' guarantees. In addition, if the direct borrowing cost becomes less than the discount rates in the forfait market, the Bank does not need to sell promissory notes. Thus, in the base case, the portion of forfaiting is assumed to be 20 per cent of the medium-term loans. The profit margin related to forfaiting is expected to be none, since the sale of promissory notes is regarded as pre-collection of loans.

109. In the sensitivity analysis, the portion of forfaiting is assumed to increase by 10 percentage points, i.e. to 30 per cent of the medium-term loans.

*8. Borrowing structure*

110. The Bank needs a fund for loan disbursement, liquidity reserves, repayment of borrowings (including interest payment) and other operating costs, while sources for the fund are capital input, borrowings (domestic and foreign), amortization of loans (principle and interest), forfaiting, and other assets. The Bank should establish the funding portfolio in the light of its total funding cost, the government budget, and the domestic and international financial market situation.

111. The basic assumptions and alternative scenarios with regard to the Bank's funding are the following: borrowings every year are determined using a residual method; export-financing needs are calculated by the leverage of total capital in the given year; the funding sources such as capital input, collected loans, forfaiting and other assets are decided at the beginning of the year; and the portion that is not covered by the above funding sources may be financed by borrowings.

112. The Bank would borrow the necessary funds in the domestic and foreign financial markets. In the base case, the ratio of domestic and foreign currency in the borrowings is assumed to be 50:50. Under the alternative scenarios, this ratio has been changed to 30:70 and 70: 30.

*9. Leverage*

113. This is perhaps one of the most important assumptions with respect to the Bank's operations. It has been assumed that the Bank would determine the ceiling of export credit in terms of its leverage of total capital, which consists of the sum of paid-in capital, reserves and retained earnings. In general, total assets are leveraged from total capital. In this model, however, the bulk of loans are short-term loans, which are repaid within a year. Thus, total loans outstanding are similar to loan disbursements in that year.

114. The leverage would increase gradually as the Bank operates. For the base case, a target leverage of 5:1 has been set at the end of the fourth and fifth year. This would imply a gradual increase from 2:1 in the first year, to 3:1 in the second year, and to 4:1 in the third year. It can increase thereafter but cannot exceed the ceiling applied by comparable international institutions.

115. In an alternative scenario, the target leverage is increased to 10:1 at the end of the fifth year. It would gradually increase from 2:1 in the first year to 4:1 in the second, 6:1 in the third and 8:1 in the fourth year. A leverage ratio of 10:1 could be regarded as rather aggressive, since it comes close to that of conservatively managed commercial banks.

*10. Others*

116. Overhead costs:

(a) Overhead costs are estimated on the basis of the number of employees. Generally speaking, the number of staff will increase as total assets, especially total loans outstanding, expand. However, for the sake of profitability, the Bank should try not to increase overhead costs faster than the loan amount.

(b) In this model, overhead costs are assumed to start at 1 per cent of export-financing needs, and then increase by 10 per cent annually, reflecting inflation rates and the increase in the number of employees. Total overheads as a percentage of total assets could be somewhat lower than for commercial banks. This is appropriate, since the Bank would not have any retail banking functions and thus would have lower operational costs as measured against total assets.

117. With regard to fee income, the Bank charges a fee for medium-term transactions (i.e. commitment fee, etc.). In this model, the fee is 2 per cent for a new medium-term loan.

118. Concerning furnishings and miscellaneous, fixed assets and miscellaneous accounts receivable are assumed to be 1 per cent of total capital (paid-in capital, reserves, and retained earnings).

119. With respect to dividends, the Bank is assumed to pay no dividends. Half of net income has been allocated to a loan-loss reserve and half to retained earnings.

## B. Results of the sensitivity analysis

120. The sensitivity analysis focuses on how much export credit the Bank can provide while maintaining an appropriate level of profitability. Under most scenarios, the Bank produces similar financial results and proves to be financially viable.

121. As for the volume of export credits over five years, it may be increased by such policies as a doubling of the capital and, particularly, greater liquidity (see chart 1 in annex III.C.). These scenarios, however, reduce the return on assets (see chart 2). In turn, higher lending rates and greater liquidity reduce the amount of exports financed but improves the return on assets (see charts 1 and 2).

122. The sensitivity analysis also includes such unfavourable developments as the combined effect of higher LIBOR rates and of a need to increase foreign borrowing, higher than foreseen borrowing costs, and higher loan-loss rates. While the Bank may need to reduce lending by relatively little (see chart 3), the return on assets will deteriorate significantly (see chart 4) under these scenarios. In the case of an increase of 1.5 per cent or more in borrowing costs or a 3 per cent loan-loss rate, it will become negative by the end of the fifth year.

### *1. Doubling capital*

123. The sensitivity analysis on capitalization shows the effects of increases in paid-in capital, particularly on the Bank's profitability.

(a) A doubling of the capital base in the first year would increase the lending capacity (see chart 1). For example, the ratio of cumulative export credit to paid-in capital in the fifth year would increase to 14.44 from 12.66 in the base case. As each year passes, the ratio becomes higher: that is, in the first two years, the effects on the volume of export credits are negligible, but, thereafter the gap between the base case and the alternative scenario widens.

(b) The sensitivity analysis shows that the US$ 10 million increment in capital input would make the profitability rates lower and lower as years pass (see chart 2.) The rate of return on total assets in the fifth year diminishes to 0.8 per cent, compared with 1.0 per cent in the base case. Also, the rate of return on total capital dwindles from 5.2 to 4.2 per cent.

### *2. Greater liquidity*

124. The effect of the liquidity/asset ratio on profitability depends on the loan-loss rates. If the loan-loss rate is assumed to be 1 per cent, the sensitivity analysis shows that a higher liquidity ratio improves profitability (see chart 2). When the Bank increases the liquidity ratio to 20 per cent from 10 per cent, cumulative export credits decrease by 6.7 per cent, but profits double by the end of the fifth year and the return on total assets goes up from 1 to 2.03 per cent. In principle, 100 per cent of assets could be kept liquid, and this would improve profitability greatly. It should be kept in mind, however, that this policy is contrary to the basic aim of the institution, which is to extend export credits as much as possible (see chart 1).

*3. Greater medium-term lending*

125. On the one hand, medium-term loans produce a higher return than short-term loans, due to higher interest rates and the transaction fee. On the other hand, short-term loans are the source of funding for the next year. Hence, a higher portion of short-term loans makes borrowing and the payment of the associated interest less necessary.

126. The test shows this combined impact of medium- and short-term loans. A higher proportion of medium-term loans would enable the Bank to provide more export credit and generate higher profit. When the ratio of short- to medium-term loans is gradually reduced from 90:10 to 85:15, 80:20, 75:25 and 70:30, the cumulative export credit increases by 1 per cent, 1.9 per cent, 3 per cent, and 3.9 per cent, respectively. In addition, the rate of return on total capital increases from 1 per cent, to 1.06 per cent 1.13 per cent, 1.19 per cent, and 1.26 per cent, respectively.

*4. Higher lending rates*

127. If the interest rates on both short- and medium-term loans increase by 1 per cent, profits obviously increase (see chart 2); however, the rise in profits is less pronounced than the increase in lending rates. According to the sensitivity analysis, the return on total assets would increase to 1.83 per cent only, instead of the expected 2 per cent. A 1 per cent increase in lending rates would also moderately expand cumulative export credits by 4 per cent (see chart 1).

*5. Higher borrowing costs*

128. The sensitivity analysis tested the effect of a 1 per cent, a 1.5 per cent and a 2 per cent increase in borrowing costs, respectively. At the end of the fifth year, a 1 per cent cost increase diminishes net income to a third of that of the base case. A 1.5 per cent increase in borrowing costs generates net loss in the fifth year, and a 2 per cent increase leads to net loss in the fourth and fifth years (see chart 4).

*6. Higher loan-loss rates*

129. When the loan-loss rate increases to 2 per cent, the net income diminishes by more than 50 per cent in the fifth year and the return on total asset drops to 0.17 per cent. Furthermore, if the rate goes up to 3 per cent, the Bank would suffer a net loss in the fourth and fifth years (see chart 4). Thus, the Bank will have to keep the loan-loss rate under 2 per cent by means of good credit risk management.

*7. Greater use of the forfaiting market*

130. The forfaiting market is a useful instrument for raising funds in the initial period of the Bank's establishment, since it can reduce borrowing needs. When the portion of promissory notes sold increases to 30 per cent of the new medium-term loans from 20 per cent in the base case, both cumulative export credits and profitability are expected to improve slightly. Loans expand by 0.4 per cent and return on capital increases to 1.12 per cent from 1 per cent. The improvement in profitability is due to the reduction in interest payable for borrowing.

131. Although it is recommended to increase the portion of forfaiting as much as possible, it is worth noting that an improvement in a country's creditworthiness in international financial markets makes borrowing less costly than the forfaiting market. Hence, the merit of the forfaiting market may eventually disappear.

*8. Higher LIBOR and different borrowing structures*

132. As the demand for export credits increases, the Bank has to expand borrowing to raise the necessary funds. In terms of cost, domestic-currency borrowings could be cheaper than foreign ones, particularly if the Government provides support to the Bank through a special budgetary fund. Nevertheless, the Bank also needs a certain level of foreign exchange in order to provide loans for imports of raw materials and to finance medium-term loans, which are generally denominated in foreign currency. The need for foreign sources of borrowing may also be linked with the shortage of domestic financial resources experienced by some developing countries.

133. When the Bank enters the international financial market for fund raising, it will generally obtain variable interest rates such as LIBOR plus spread. The spread may be differentiated according to the creditworthiness of individual countries.

134. In one of the alternative scenarios, the share of domestic-currency borrowing is assumed to decrease from 50 to 30 per cent as the LIBOR increases from 8 to 10 per cent. In such a case, net income will decrease sharply: the return on assets would drop to 0.17 per cent in the fifth year (see chart 4).

135. On the other hand, if the share of domestic currency increases to 70 per cent, return on assets increases to 0.73 per cent. However, it is still less than in the base case. Because profitability is greatly affected by fluctuations of the LIBOR, the Bank should seek to utilize domestic-currency borrowings as much as possible, except for the amount required for foreign-exchange-denominated lending.

*9. Greater leverage*

136. If the Bank sets a target leverage of as high as 10:1 rather than 5:1 as in the base case, cumulative export credit will be substantially larger; in the fifth year, it will be 95 per cent higher than in the base case (see chart 1). However, at the end of the fifth year, return on total capital decreases by half, to 0.49 per cent, down from 1 per cent in the base case (see chart 2). That is, the higher the leverage is, the better the export credit performance and the lower the profitability.

## Annex I

## COMPARATIVE ADVANTAGE BY PRODUCT

### A. Estimation of revealed comparative advantage by product

1. The concept of revealed comparative advantage (RCA), introduced by Balassa in 1965, pertains to the relative export performance of a country in particular commodities. The word "revealed" was derived from the idea that the commodity pattern of trade is assumed to "reveal" the comparative advantage of the trading countries on the assumption that this pattern reflects international differences in relative costs, as well as non-price factors.

2. Thus, revealed comparative advantage indexes have been derived from data in relative export shares. The indexes have been calculated by dividing a country's share in the export of a given commodity category by the share in the world's export of manufactured goods, as shown in the following equation:

$$RCA_{i,j} = \frac{E_{i,j} / E_{tot,j}}{E_{i,world} / E_{tot,world}} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

where $RCA_{i,j}$ are j country's revealed comparative advantage index for product group i, $E_{i,j}$ are exports of product I by exporter j, and $E_{tot}$ are total exports of manufactured goods. For example, an index number of 1.1 means that the export share of the country in commodity I is 10 per cent higher than its share in the total exports of the world's manufactured goods.

### B. Method for examining the change of dynamic comparative advantages

3. Balassa's two-stage approach[1] examined the revealed comparative advantage of an industry with physical capital intensity and human capital intensity, using his revealed comparative advantage analysis method and Chenery-Syrquin's approach of "patterns of development"[2]. That is, he established the following equation:

$$\log RCA_{ij} = \beta_{0i} + \beta_{1i} \log HC_j + \beta_{2i} \log PC_j \quad \ldots\ldots\ldots\ldots \quad (2)$$

where PC is physical capital intensity, HC is human capital intensity, i is each country, and j is each industry. Value added per capita minus average wage is used for physical capital intensity, and average wage is used for human capital intensity. The physical capital intensity and the human capital intensity of an industry are assumed to be the same, regardless of country and period.

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[1] See "A 'Stages' Approach to Comparative Advantage", World Bank Staff Working Paper, No. 256, May 1977.

[2] Chenery and Syrquin analyzed the correlation between per capita income and industrial structure. See their *Patterns of Development 1950-70*, Oxford University Press, London, 1975.

4. In order to examine the dynamic change of estimated coefficients of equation (2), $\beta$ is again estimated in a new equation, using time series data:

$$\beta_{ki} = a_{k0} + a_{k1} KS_t + a_{k2} LQ_t \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (3)$$

where k is from 0 to 2, KS is total capital stock per capita, LQ is quality of labour, and t is each year. Labour quality can be indicated as a ratio of high-school graduates.

5. It is possible to forecast $\beta$ in the future by assuming the total capital stock per capita and the quality of labour in the future. Then, by plugging the forecasted $\beta$ into equation (2), it is possible to examine the change of revealed comparative advantage of an industry.

**Example: The top 10 revealed-comparative-advantage products of the Republic of Korea (1965-1992)**

| Rank | 1965 | 1970 | 1975 | 1980 | 1985 | 1990 | 1995 |
|---|---|---|---|---|---|---|---|
| 1 | Veneers, plywood | Veneers, plywood | Veneers, plywood | Under-garments, not knitted | Ships and boats | Headgear, non-textile clothing | Trailers, nonmotor vehicles |
| 2 | Cotton fabrics, woven | Misc. manuf. goods | Travel goods, handbags | Headgear, non-textile clothing | Headgear, non-textile clothing | Trailers, nonmotor vehicles | Woven man-made fibre fabric |
| 3 | Clothing | Clothing, not of fur | Clothing, not of fur | Travel goods, handbags | Travel goods, handbags | Footwear | Headgear, non-textile clothing |
| 4 | Tulle, lace, embroidery, ribbon etc. | Cutlery | Tulle, lace, embroidery, ribbon etc. | Textile clothing accessory | Under-garments, not knitted | Travel goods, handbags | Ships and boats |
| 5 | Textile fabrics | Tulle, lace, embroidery, ribbon etc. | Fur etc., cloth products | Men's outwear, not knitted | Footwear | Woven man-made fibre fabric | Television receivers |
| 6 | Universals, plates and sheets of iron and steel | Footwear | Cutlery | Footwear | Men's outwear, not knitted | Radio broadcast receiver | Transistor valves etc. |
| 7 | Glassware | Travel goods, handbags | Misc. manu-factured goods | Woven man-made fibre fabric | Structures and parts nes | Ships and boats | Textile clothing accessories |
| 8 | Special textile fabrics etc. | Lime, cement, building products | Footwear | Tulle, lace, embroidery, ribbon etc. | Woven man-made fibre fabric | Television receivers | Knitted etc. fabrics |
| 9 | Made-up textiles nes | Special textile fabrics etc. | Lime, cement, building products | Cutlery | Trailers, nonmotor vehicle | Cutlery | Footwear |
| 10 | Misc. manuf. goods | Textile fabrics nes | Textiie fabrics nes | Textile fabrics nes | Under-garments, knitted | Lime, cement, building products | Travel goods, handbags |

## Annex II

## CALCULATING THE ECONOMIC INTERNAL RATE OF RETURN

### A. Determining the internal rate of return

1. An internal rate of return is the rate expected to be earned on an investment project. It discounts a project's cash flow to a net present value of zero. In order to obtain the internal rate of return, represented by the sign r, the equation is calculated as follows:

$$0 = \frac{CF_1}{1 + r} + \frac{CF_2}{(1 + r)^2} + \ldots + \frac{CF_n}{(1 + r)^n} - I \quad \ldots\ldots\ldots\ldots \quad (4)$$

where CF represents cash flow and I investment.

### B. Application to the Bank's export credit

2. Net benefit is calculated as follows:

   a. The net present value of the export contract is considered to be the benefit. The related cost is the net present value of the foreign currency cost required for the export. Thus, net benefit is obtained by subtracting the cost from the benefit. Net benefit may be added by the effects on the national economy in terms of national income, balance of payments, employment, etc., if the Bank can quantify the effects.

   b. For the calculation of net present value, each country's market interest rate is used as a discount rate.

3. The shadow foreign exchange rate is calculated as follows:

   a. Since foreign exchange rates are often distorted in developing countries, it is necessary to adjust them to reflect the real net benefit for the national economy. This is done by calculating the shadow foreign exchange rate.

   b. The shadow exchange rate differs from the official rate because of the existence of import tariffs and quotas, and export support policies.

   c. The shadow foreign exchange rate coefficient is calculated using the following formula:

$$\frac{e_e}{e_0} = \frac{\sum_i E_x X_i + \sum_i E_m M_i}{\sum_i E_x X_i / (1 + s_i) + \sum_i E_m M_i / (1 + t_i)} \quad \ldots\ldots\ldots \quad (5)$$

where $e_e / e_0$ is the shadow foreign exchange rate coefficient, $X_i$ is exports, $M_i$ is imports, $E_x$ is the price elasticity of exports, $E_m$ is the price elasticity of imports,

$t_i$ is the tariff rate and $s_i$ is the export subsidy rate.

d. A project in which, the amount of local currency deriving from the foreign exchange net benefit converted with this shadow foreign exchange rate covers local costs, such as expenses local materials and labour, should be eligible for export credit.

4. An example of a calculation of the present value of net benefit is as follows:

a. Assumptions:

Export contract amount: A
Ratio of advanced cash payment: p
Lending interest rate (fixed): m
International market interest rate (average during the loan period): r
When the export object is delivered, the time is 0
Collection of the loan: equal amount for t period
Cash advance payment is received one year before delivery

b. Calculation of the present value of revenues and expenses:

*Receipt of cash payment*: Ap(1+r)
*Collection of the loan*: Amortization (S)

$$S = \frac{(1 - P)\,A}{N} + \frac{(1 - P)\,A}{N} \cdot \frac{1}{1 + r} + \frac{(1 - P)\,A}{N} \cdot \frac{1}{(1 + r)^2} + \\ + \ldots + \frac{(1 - P)\,A}{N} \cdot \frac{1}{(1 + r)^{n-1}} \qquad \ldots\ldots (6)$$

Interest (I)

$$I = (1 - P)\,A \cdot \frac{1 + \bar{r}}{1 + r} + \left\{ A - \frac{(1 - P)\,A}{N} \right\} \cdot \frac{1 + \bar{r}}{1 + r} + \\ + \left\{ A - \frac{2\,(1 - P)\,A}{N} \right\} \cdot \frac{1 + \bar{r}}{(1 + r)^2} + \ldots + \qquad \ldots\ldots\ldots (7) \\ + \frac{(1 - P)\,A}{N} \cdot \frac{1 + \bar{r}}{(1 + r)^{n-1}}$$

*Expenses for foreign commodity* imported during the period (F): F(1+r).
*Present value of net benefit*: (receipt of cash payment + collection of the loan) - (expenses for foreign commodity)

## Annex III

## SUMMARY OF SCENARIOS AND SENSITIVITY ANALYSIS

### A. Base case and alternative scenarios

1. Doubling capital (US$ thousand)

| Base | | | | | Alternative | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 |
| 10,000 | 0 | 10,000 | 0 | 10,000 | 20,000 | 0 | 10,000 | 0 | 10,000 |

2. Greater liquidity

| Base | Alternative |
|---|---|
| 10% | 20% |

3. Greater medium-term lending

| Base | | Alternative | |
|---|---|---|---|
| Short-term | Medium-term | Short-term | Medium-term |
| 90% | 10% | 85%, 80%, 75%, 70% | 15%, 20%, 25%, 30% |

4. Higher lending rates

| Base | | Alternative | |
|---|---|---|---|
| Short-term | Medium-term | Short-term | Medium-term |
| 9% | 10% | 10% | 11% |

5. Higher borrowing costs

| Base | | Alternative | |
|---|---|---|---|
| Domestic borrowing | Foreign borrowing | Domestic borrowing | Foreign borrowing |
| 10% | LIBOR+2% | 11%<br>12%<br>11.5% | LIBOR+3%<br>LIBOR+4%<br>LIBOR+3.5% |

6. Higher loan-loss rates

| Base | Alternative |
|---|---|
| 1% | 2%, 3% |

7. Greater use of the forfaiting market

| Base | | Alternative | |
|---|---|---|---|
| Short-term | Medium-term | Short-term | Medium-term |
| 0% | 20% | 0% | 30% |

8. Higher LIBOR and different borrowing structures

| Base | Alternative |
|---|---|
| 8% | 10% |

| Base | | Alternative | |
|---|---|---|---|
| Domestic borrowing | Foreign borrowing | Domestic borrowing | Foreign borrowing |
| 50% | 50% | 70%<br>30% | 30%<br>70% |

9. Greater leverage

| Base | | | | | Alternative | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 |
| 2 | 3 | 4 | 5 | 5 | 2 | 4 | 6 | 8 | 10 |

**B. Summary results of the sensitivity analysis**

| | Export credit (cumulative, US$ thousand) | Total assets (US$ thousand) | Total capital (US$ thousand) | Net income (US$ thousand) | Return on total capital | Return on total assets |
|---|---|---|---|---|---|---|
| *Base case* | | | | | | |
| | 379,965 | 178,328 | 34,327 | 1,778 | 5.18% | 1.00% |
| *1. Doubling capital* | | | | | | |
| | 577,525 | 247,450 | 46,910 | 1,956 | 4.17% | 0.80% |
| *2. Greater liquidity* | | | | | | |
| | 356,053 | 191,523 | 37,043 | 3,897 | 10.52% | 2.03% |
| *3. Greater medium-term lending (short-term : medium-term)* | | | | | | |
| *(85 : 15)* | 383,595 | 184,040 | 34,776 | 1,956 | 5.62% | 1.06% |
| *(80 : 20)* | 387,266 | 189,863 | 35,232 | 2,143 | 6.08% | 1.13% |
| *(75 : 25)* | 390,978 | 195,797 | 35,694 | 2,339 | 6.55% | 1.19% |
| *(70 : 30)* | 394,732 | 201,844 | 36,164 | 2,544 | 7.03% | 1.26% |
| *4. Higher lending rates* | | | | | | |
| | 395,235 | 189,028 | 36,409 | 3,468 | 9.52% | 1.83% |
| *5. Higher borrowing cost (percentage of borrowing cost over the base case)* | | | | | | |
| *(+1%)* | 370,449 | 171,278 | 32,951 | 528 | 1.60% | 0.31% |
| *(+2%)* | 360,967 | 164,285 | 31,587 | -667 | -2.11% | -0.41% |
| *(+1.5%)* | 365,703 | 167,774 | 32,268 | -76 | -0.24% | -0.05% |
| *6. Higher loan-loss rates* | | | | | | |
| *(2%)* | 369,476 | 168,811 | 32,742 | 287 | 0.88% | 0.17% |
| *(3%)* | 359,196 | 159,628 | 31,198 | -1,113 | -3.57% | -0.70% |
| *7. Greater use of the forfaiting market* | | | | | | |
| | 381,630 | 178,704 | 34,561 | 2,003 | 5.80% | 1.12% |
| *8. Higher LIBOR and different borrowing structures (domestic borrowing : foreign borrowing)* | | | | | | |
| *(70 : 30)* | 378,215 | 176,612 | 33,988 | 1,281 | 3.77% | 0.73% |
| *(30 : 70)* | 370,580 | 170,958 | 32,884 | 291 | 0.88% | 0.17% |
| *9. Greater leverage* | | | | | | |
| | 646,476 | 355,001 | 34,413 | 1,757 | 5.11% | 0.49% |

## C. Summary charts of the sensitivity-analysis results

Chart 1

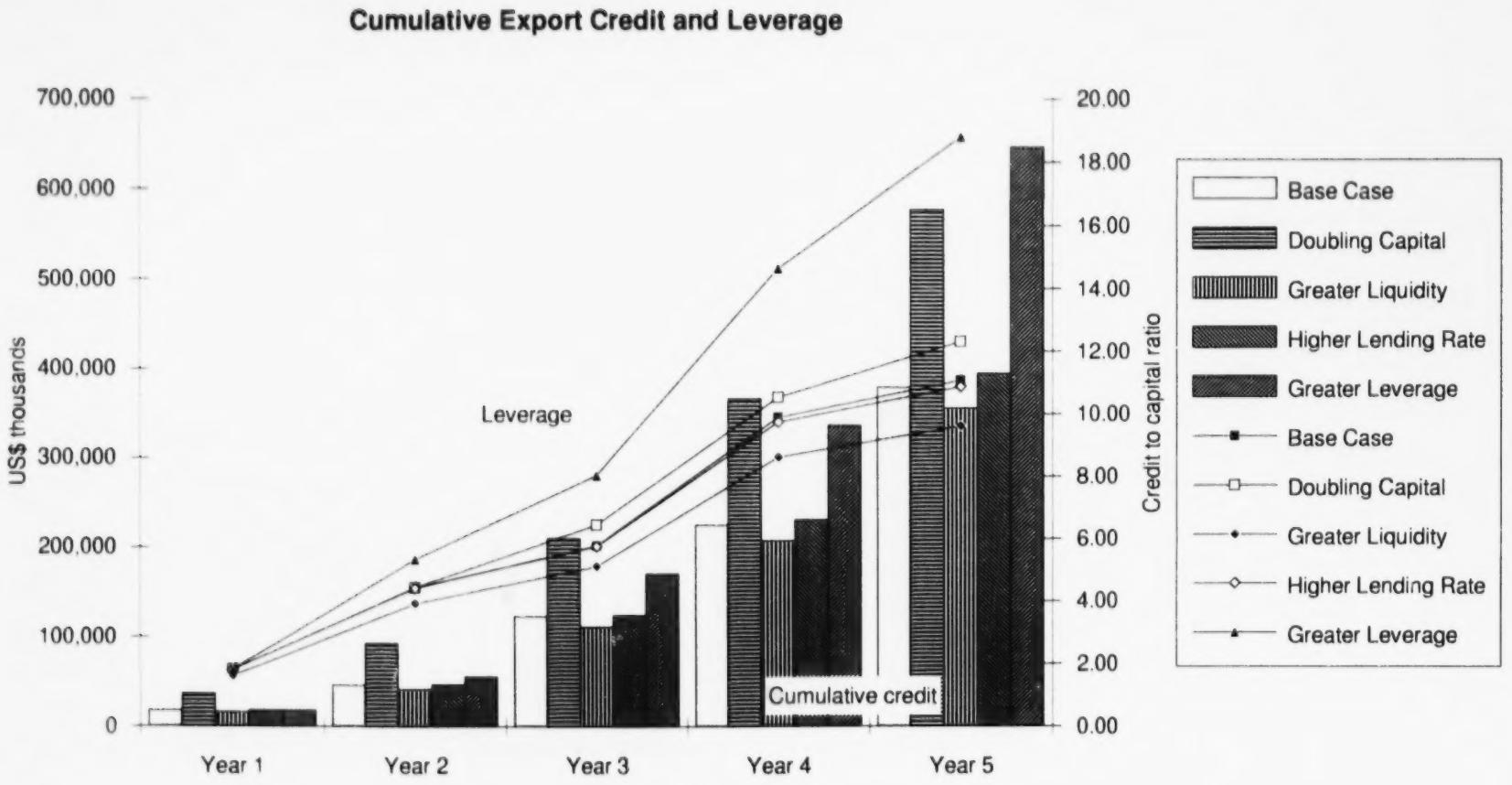

Cumulative Export Credit and Leverage
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
US$ thousands
20.00
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Credit to capital ratio
Leverage
Cumulative credit
Year 1
Year 2
Year 3
Year 4
Year 5
Base Case
Doubling Capital
Greater Liquidity
Higher Lending Rate
Greater Leverage
Base Case
Doubling Capital
Greater Liquidity
Higher Lending Rate
Greater Leverage

Chart 2

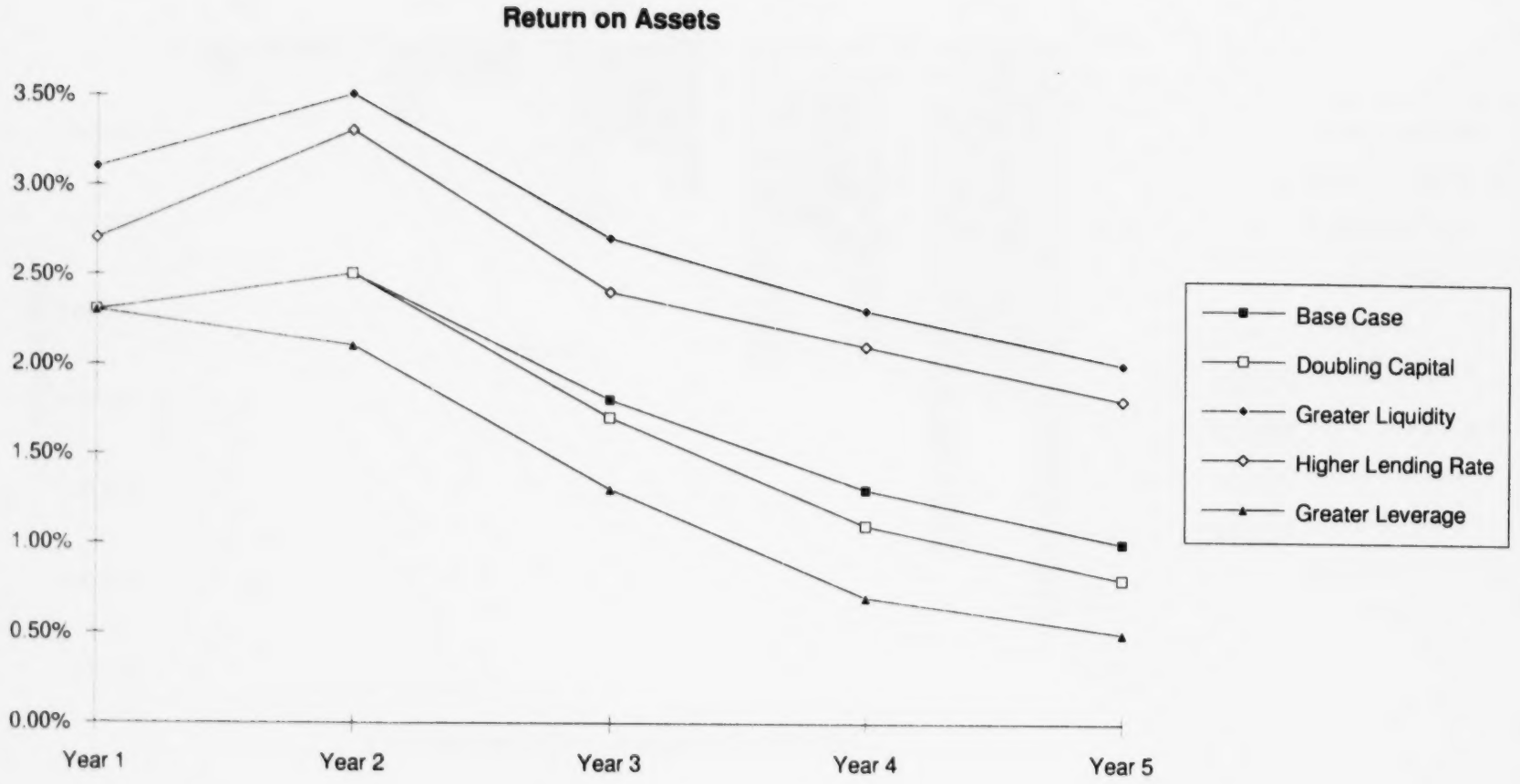
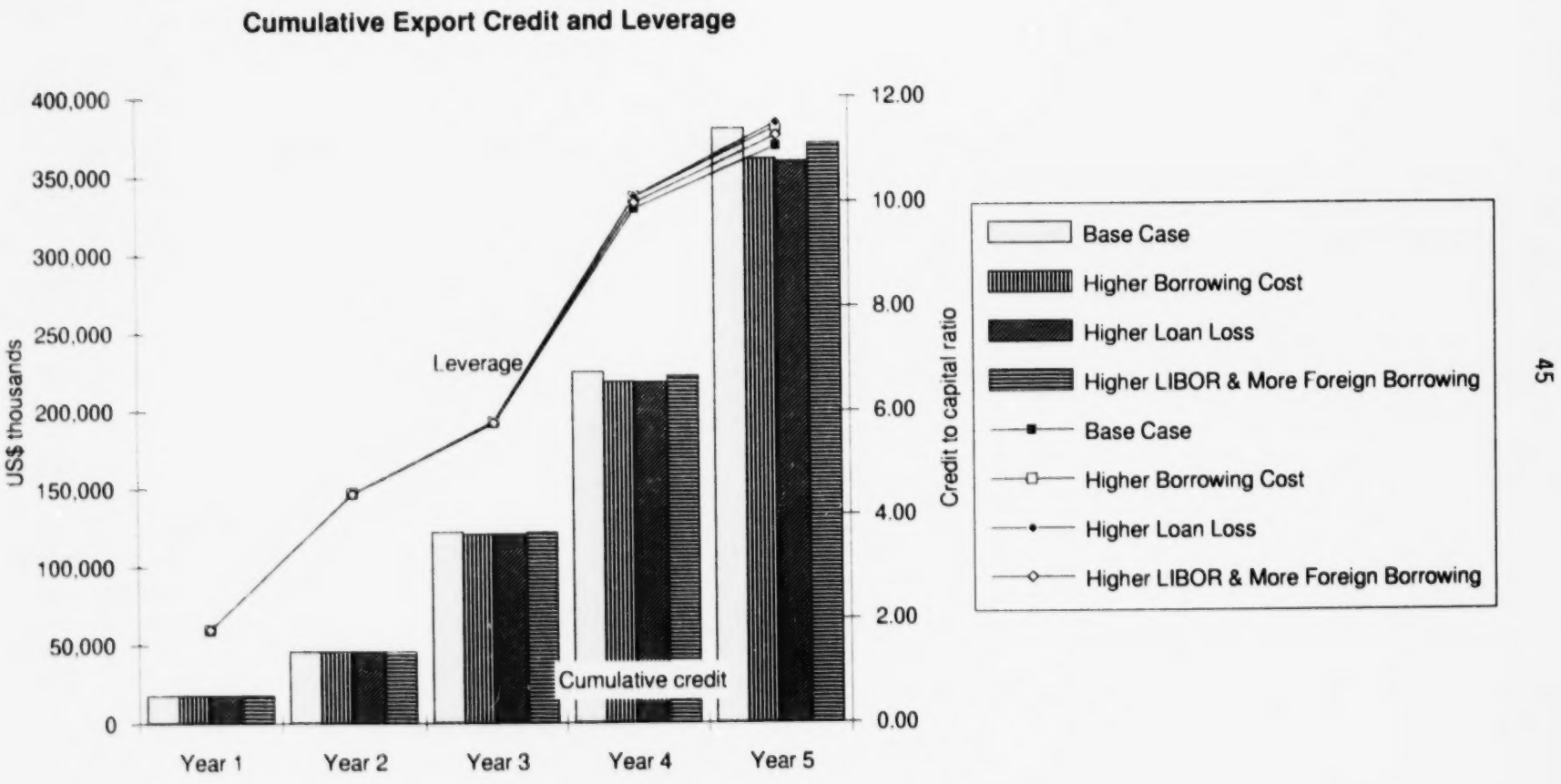
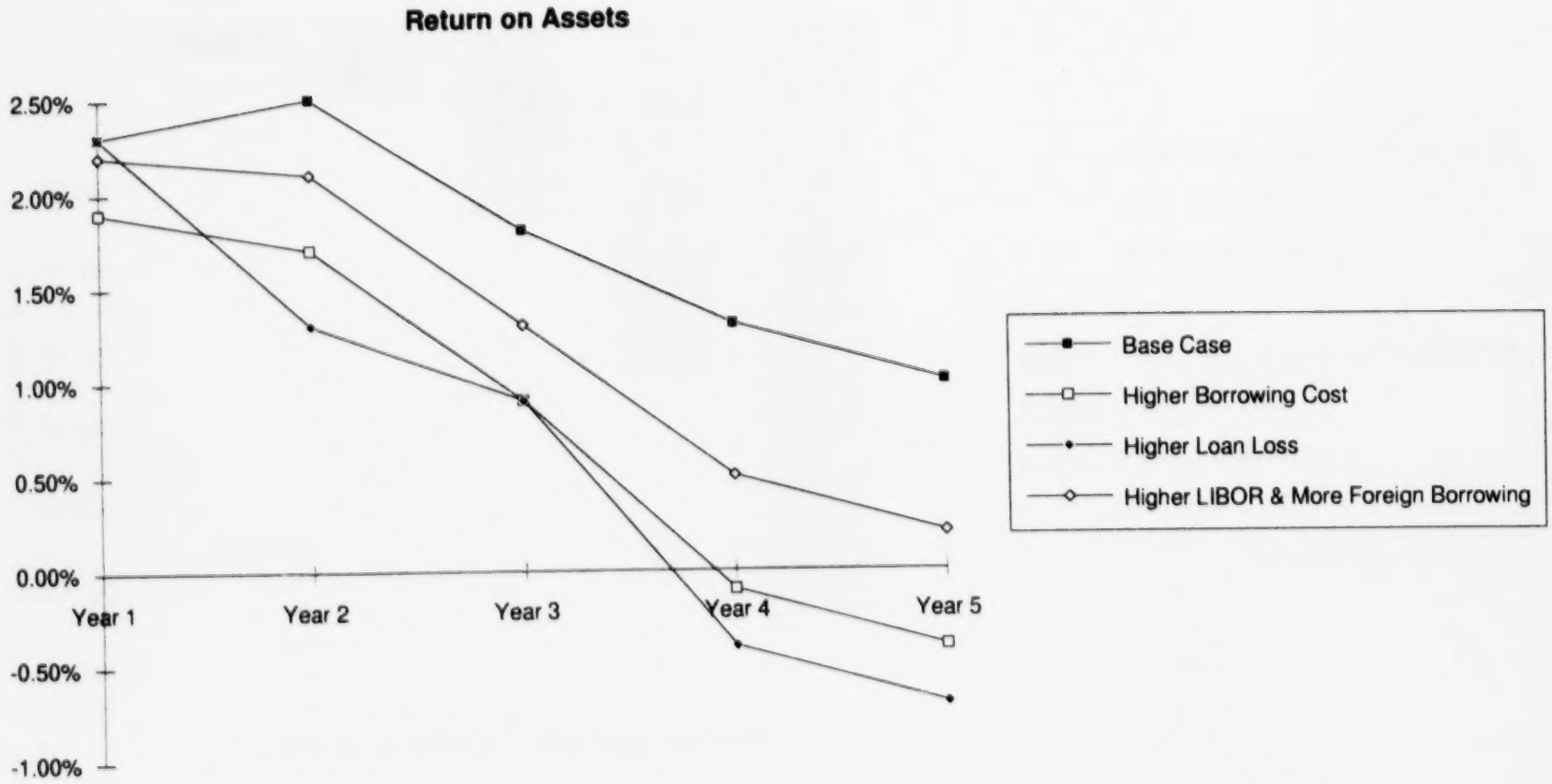

Return on Assets
3.50%
3.00%
2.50%
2.00%
1.50%
1.00%
0.50%
0.00%
Year 1
Year 2
Year 3
Year 4
Year 5
Base Case
Doubling Capital
Greater Liquidity
Higher Lending Rate
Greater Leverage

Chart 3


Cumulative Export Credit and Leverage
US$ thousands
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Credit to capital ratio
Leverage
Cumulative credit
Year 1
Year 2
Year 3
Year 4
Year 5
Base Case
Higher Borrowing Cost
Higher Loan Loss
Higher LIBOR & More Foreign Borrowing
Base Case
Higher Borrowing Cost
Higher Loan Loss
Higher LIBOR & More Foreign Borrowing

C art 4


Return on Assets
2.50%
2.00%
1.50%
1.00%
0.50%
0.00%
-0.50%
-1.00%
Year 1
Year 2
Year 3
Year 4
Year 5
Base Case
Higher Borrowing Cost
Higher Loan Loss
Higher LIBOR & More Foreign Borrowing

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| Technical accuracy | ☐ | ☐ | ☐ | ☐ | ☐ |
| Quality of analysis, including objectivity | ☐ | ☐ | ☐ | ☐ | ☐ |
| Validity of conclusions | ☐ | ☐ | ☐ | ☐ | ☐ |
| Clarity of recommendations | ☐ | ☐ | ☐ | ☐ | ☐ |
| Comprehensiveness of coverage | ☐ | ☐ | ☐ | ☐ | ☐ |

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